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मानक

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IS 14561 (2007): Fire resisting (insulating) filing cabinets [MED 24: Security Equipment]



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भारतीय मानक

अग्नि प्रतिरोधी उष्मारोधी (फाइलिंग) केबिनेट — विशिष्टि

(पहला पुनरीक्षण)

Indian Standard

FIRE RESISTING (INSULATING) FILING CABINETS —
SPECIFICATION

(*First Revision*)

ICS 97.140:13.220

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard (First Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Security Equipment Sectional Committee had been approved by the Mechanical Engineering Division Council.

This standard was published in 1998. The experience gained in implementation of this standard has necessitated this revision. The major changes in this revision are:

- a) Lateral filing cabinet is added.
- b) Ratings of 180 min and 240 min have been added.
- c) Restriction on size has been removed.
- d) Telescopic suspension system is also added for drawers.

Security equipment play a vital role in the safe custody of cash, jewellery, important documents, etc, in various establishments such as banks, hotels, commercial organizations, shops, etc. A number of standards had been formulated on security equipments. This standard on fire resisting (insulating) filing cabinets is one such standard.

Record protection cabinets and filing cabinets are generally used to insulate the paper media against fire only. Record protection cabinets (*see* IS 14203 : 1999 'Fire resisting record protection cabinets — Specification') are used for protection of ledgers, account books, legal documents, etc. The insulating filing cabinets covered by this standard are generally used to protect the vital information and records/documents stored in the form of files. These cabinets may be kept either in strong rooms/book rooms for added protection against theft and fire or may be kept in open halls.

The composition of the Committee responsible for the formulation of this standard is given in Annex C.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

FIRE RESISTING (INSULATING) FILING CABINETS — SPECIFICATION

(First Revision)

1 SCOPE

This standard lays down the requirements regarding materials, sizes and details of construction of fire resisting filing cabinets which insulates the paper media stored in files against fire.

2 REFERENCES

The standards listed in Annex A contain provisions, which through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revisions and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated in Annex A.

3 TYPES AND RATING

3.1 The fire resisting filing cabinets shall be of two types:

- a) Standard fire resisting filing cabinet, and
- b) Lateral fire resisting filing cabinet.

3.2 The standard and lateral fire resisting filing cabinets shall have one-drawer or two-drawers or three-drawers or four-drawers. A typical drawing of the fire resisting filing cabinet is given in Fig. 1.

3.3 The fire resisting filing cabinets shall have fire resisting ratings of 60 min or 120 min or 180 min or 240 min.

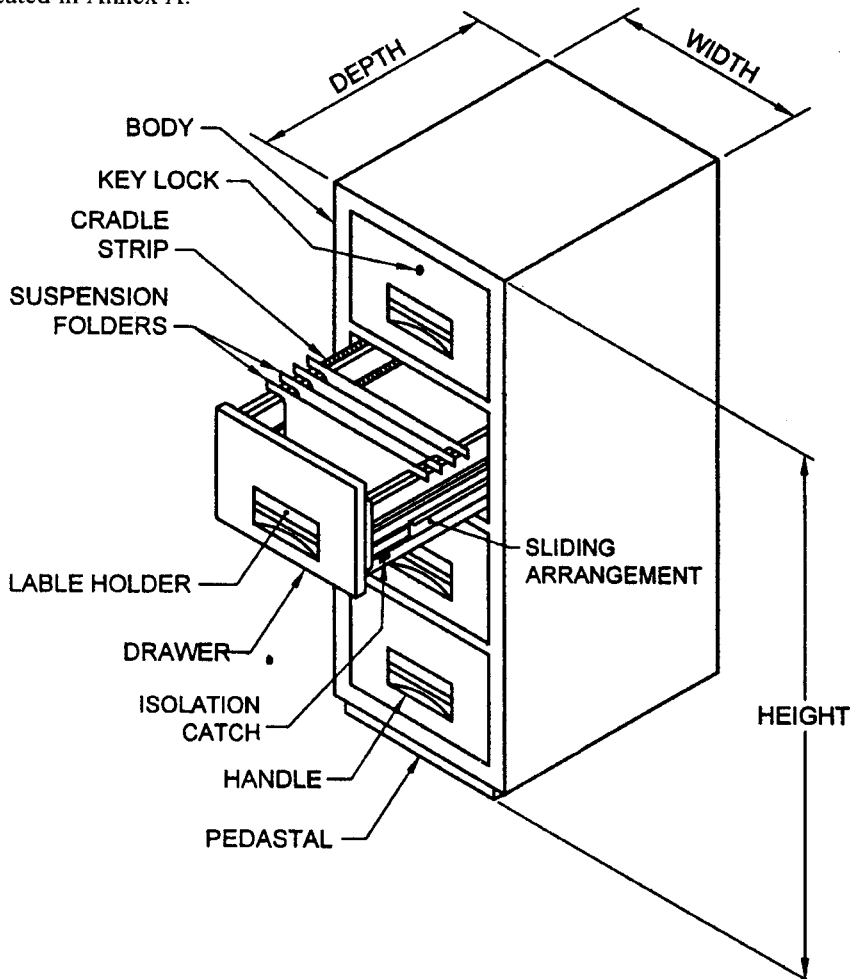


FIG. 1 TYPICAL FIRE RESISTING FILING CABINET

4 DIMENSIONS AND TOLERANCES**4.1 Overall Dimensions of Fire Resisting Filing Cabinets**

filing cabinets shall be as specified in Table 1 or any other size which is mutually agreed to between the purchaser and the supplier. All the dimensions given in Tables 1, 2 and 3 shall be within ± 50 mm.

The overall dimensions of the fire resisting (insulating)

Table 1 Overall Dimensions of Standard Fire Resisting Filing Cabinet

SI No.	Description mm	One-Drawer	Two-Drawer	Three-Drawer	Four-Drawer
(1)	(2)	(3)	(4)	(5)	(6)
i)	Height	450	850	1 200	1600
ii)	Width	550	550	550	550
iii)	Depth	825	825	825	825

NOTE — Height is inclusive of pedestal.

Table 2 Overall Dimensions of Lateral Fire Resisting Filing Cabinet*(Clause 4.1)*

SI No.	Description mm	One-Drawer	Two-Drawer	Three-Drawer	Four-Drawer
(1)	(2)	(3)	(4)	(5)	(6)
i)	Height	450	850	1 200	1 600
ii)	Width	965	965	965	965
iii)	Depth	550	550	550	550

NOTE — Height is inclusive of pedestal.

Table 3 Internal Dimensions of Drawer*(Clause 4.1)*

SI No.	Description mm	Standard Fire Resisting Filing Cabinet	Lateral Fire Resisting Filing Cabinet
(1)	(2)	(3)	(4)
i)	Height	250	250
ii)	Width	400	800
iii)	Depth	650	400
iv)	Height of the bottom drawer above floor level, mm, <i>Min</i>	60	60

5 MATERIALS

The different parts of the filing cabinet shall be manufactured from materials as specified in Table 4.

6 DESIGNATION

The filing cabinet shall generally be designated by the commonly used name, type, the fire rating and the number of this Indian Standard.

Example:

A four-drawer type filing cabinet with 120 min fire rating shall be designated as:

- a) Standard fire resisting (insulating) filing cabinet, Four-Drawer FR-120 IS 14561
- b) Lateral fire resisting (insulating) filing cabinet Four-Drawer LFR-120 IS 14561

7 CONSTRUCTION

7.1 Outer Body and Inner Box

Outer body and inner box shall be fabricated from mild steel sheets of not less than 0.8 mm and not more than 1.2 mm nominal thickness. The steel shall not have any burrs or dents. If required the outer body shall be suitably stiffened to avoid bulging.

7.2 Cabinets Sub-assembly

The external body and drawer fronts of the fire resisting (insulating) filing cabinet shall be of double wall type with homogeneous insulating material filled in-between. Further the construction of the cabinet shall be such that each drawer slides in an individual inner box. The inner boxes shall have a insulating layer between each other to prevent fire spreading from one drawer to another. The joining of inner box, intermediate piece and outer body shall be such that, it forms a cavity to receive drawer front.

7.3 Filing Drawer

The drawer shall be made from steel sheet of not less than 0.6 mm and not more than 1.0 mm nominal thickness and shall have an arrangement on the sides suitable for the drawer suspension system and an arrangement to stop it when fully pushed in.

7.3.1 Drawer Front

The drawer front shall be made from mild steel sheet of not less than 0.6 mm and not more than 1.0 mm nominal thickness and shall be firmly secured to the drawer body by welding, screwing or riveting or a combination of three. The construction of drawer front shall be such that it snugly fits in the cavity provided for the same.

7.4 Latch

7.4.1 Each drawer of the cabinet shall be removable but shall be fitted with a latch/positive stop to prevent inadvertent withdrawal and rebound. Such latch shall be lifted/unlocked by the pull of the handle or any other mechanism.

7.4.2 The locking mechanism shall be designed in such a manner so that there is minimum passage for direct conduction of heat from outside to inside.

7.5 Drawer Suspension

7.5.1 The drawer suspension shall be either of the following types to ensure withdrawal of the full depth of the drawer:

- a) Ball bearing suspension,
- b) Solid roller suspension,
- c) Ball bearing roller suspension, and
- d) Telescopic slide suspension.

7.6 Handles

Each drawer shall be provided either with a handle made from ferrous (powder coated), non-ferrous or polymer

Table 4 Materials for Components of Fire Resisting (Insulating) Filing Cabinet

(Clause 5)

Sl No.	Components	Material Specifications
(1)	(2)	(3)
i)	Outer body, inner box drawer, locking mechanism clutch compressor plate, cradle strip, etc	IS 513, IS 1079, IS 2062, IS 1732, IS 6603, IS 6911, IS 9550
ii)	All non-ferrous components	IS 292, IS 306, IS 410, IS 713, IS 7608
iii)	Bolts, screws and nuts	IS 1365, IS 1366, IS 7173, IS 6101
iv)	Keys	IS 6603, IS 6911

NOTE — The manufacturer is free to use one or more of the applicable raw materials.

material/ABS, any corrosion resistant material and fixed to the front of the drawer or with a built-in pulling mechanism.

7.6.1 The drawer handle shall be strong enough to take a minimum pull of 50 N. There shall be no sharp corners or edges to avoid injury and damage to clothing.

7.7 Locks

7.7.1 Top drawer shall be provided with dual control key lock having not less than 6 levers or pin cylinder lock having not less than 6 pins, with duplicate keys of stainless steel/brass. Alternatively if required by the purchaser a 3 wheel combination lock or electronic combination lock may be provided either in place of key lock or in addition to key lock.

7.7.2 Each drawer may also be provided with individual key lock or pin cylinder lock or combination lock subject to agreement between the purchaser and the supplier.

7.8 Locking Mechanism

7.8.1 The locking mechanism shall be such that when the top drawer is pushed-in fully, it actuates locking mechanism to lock all other drawers simultaneously, when they are in pushed-in position.

7.8.1.1 At the time of locking the cabinet, if one of the drawers is not fully pushed-in, that drawer shall remain unlocked and can be used. As soon as that drawer is pushed-in fully, it shall get locked automatically without further operation of key by the user.

7.8.1.2 In addition to the above, isolation mechanism shall also be provided to permit independent locking/use of other drawers. Such isolation mechanism provided on drawers shall be manually operated.

8 ASSEMBLY

8.1 The components shall be assembled by bolting, welding, rivetting or by combination of the above three methods.

8.2 All joints between outer body and inner boxes, the drawer front and the outer body shall be such that, there is minimum direct conduction of heat from outer body to inner boxes.

9 TESTING

9.1 Test for Checking Strength of Cradle Strips

When a drawer is loaded with uniformly distributed load of 30 kg, the cradle strips or other file hanging system shall not deflect more than 3 mm in vertical direction. The operative edges of cradle strips should be smooth/rounded in order to facilitate easy movement of files. It shall retain the original shape after test.

9.2 Drawer Suspension Test and Latch Test

The drawer loaded with evenly distributed load of 30 kg

(excluding the weight of drawer) in any drawer shall be operated for 5 000 cycles at a rate not less than 300 cycles per hour. One opening and one closing shall constitute one cycle. After 5 000 cycles the suspension slide and latch mechanism shall not show any apparent distortion, cracks, or failures to operate in a normal smooth manner.

10 PAINTING

All surfaces before painting shall be thoroughly degreased and cleaned of rust and scale by normal pickling process and treated chemically to prevent from rusting. The cabinet shall then be painted inside and outside with an anti corrosive primer conforming to IS 2074 followed by two undercoats of paints conforming to IS 110, IS 133 or IS 3537 and finally painted with enamel paint conforming to IS 3537 or nitrocellulose paint conforming to IS 6126 or alkyde amino paints conforming to IS 11811 or any other paint system like polyurethane paint, powder coating, etc, mutually agreed to between the purchaser and the supplier.

11 TESTS AND CRITERIA FOR CONFORMITY

11.1 Two samples known to be fully representative of the lot of fire resisting (insulating) filing cabinets of the adopted design and construction shall be selected on the basis of random sampling by certifying agency. Out of the selected samples, one sample shall be subjected to fire endurance test (*see B-3.1*) and other sample shall be subjected to fire and impact test (*see B-3.2*).

11.2 The fire resisting (insulating) filing cabinets shall be considered to be conforming to the requirements of this standard if they successfully complete the fire endurance test (*see B-3.1*) and fire and impact test (*see B-3.2*); and the contents (*see B-1.1*) kept in the cabinets during the test are usable. The contents are considered to be usable after tests, if they are able to withstand ordinary handling without crumbling or falling apart and the writings on them are legible.

12 MARKING

12.1 Marking of Cabinets

A metal plate showing classification of cabinet together with the manufacturer's name, serial number and the year of manufacture shall be fixed on the inner top flange of the top drawer front.

12.2 Marking on Keys

The keys shall bear an identification number which shall not be the same as the serial number of the cabinet.

12.3 BIS Certification Marking

The fire resisting (insulating) filing cabinets may also be marked with the Standard Mark.

12.3.1 The use of the Standard mark is governed by the provisions of the *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of the Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

13 PACKING

Each cabinet shall be packed in accordance with the best trade practice with drawers unlocked. The keys shall be separately sealed in a box and placed inside the top drawer. The key may also be packed and dispatched separately or delivered in some other manner if the purchaser so requires.

ANNEX A

(Clause 2)

LIST OF REFERRED INDIAN STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
110:1983	Ready mixed paint, brushing, grey filler, for enamels for use over primers (<i>second revision</i>)		engineering purposes (<i>second revision</i>)
133:2004	Enamel, interior: (a) Undercoating, (b) Finishing — Specification (<i>fourth revision</i>)	2062:2006	Hot rolled low, medium and high tensile structural steel (<i>sixth revision</i>)
196:1966	Atmospheric conditions for testing (<i>revised</i>)	2074:1992	Ready mixed paint, air drying, red oxide-zinc chrome, priming (<i>second revision</i>)
292:1983	Specification for leaded brass ingots and castings (<i>second revision</i>)	3537:1966	Ready mixed paint, finishing, interior, for general purposes, to Indian Standard Colours No. 101, 216, 217, 219, 275, 281, 352, 353, 358 to 361, 363, 364, 388, 410, 442, 444, 628, 631, 632, 634, 693, 697, white and black
306:1983	Tin bronze ingots and castings (<i>third revision</i>)	6101:2005	Slotted pan head screws — Product Grade A (<i>first revision</i>)
410:1977	Cold rolled brass sheet, strip and foil (<i>third revision</i>)	6126:1971	Nitro cellulose surfacer
513:1994	Cold rolled low carbon steel sheets and strips (<i>fourth revision</i>)	6603:2001	Stainless steel bars and flats — Specification (<i>first revision</i>)
713:1981	Zinc base alloy ingots for die casting (<i>second revision</i>)	6911:1992	Stainless steel plate, sheet and strip (<i>first revision</i>)
1079:1994	Hot-rolled carbon steel sheets and strips — Specification (<i>fifth revision</i>)	7173:1989	Slotted pan head tapping screws (<i>first revision</i>)
1365:1978	Specification for slotted countersunk head screws — Product Grade A (<i>third revision</i>)	7608:1987	Phosphor bronze wire for general engineering purposes (<i>first revision</i>)
1366:2002	Slotted cheese head screws — Product Grade A (<i>third revision</i>)	9550:2001	Bright steel bars — Specification (<i>first revision</i>)
1732:1989	Dimensions for round and square steel bars for structural and general	11811:1986	Alkyd resins

ANNEX B

(Clauses 11.1 and 11.2)

PERFORMANCE TESTS FOR FIRE RESISTING (INSULATING) FILING CABINETS

B-1 TEST EQUIPMENT

B-1.1 Contents

Contents of the fire resisting (insulating) filing cabinets subjected to these tests shall include currency-note-grade paper, file, letter, record-form paper (printed, typed or hand written).

B-1.2 Thermocouple

Thermocouple enclosed in protection tube of suitable material and dimensions shall have time constant of the protected thermocouple assembly within the range from 5 to 7.2 min.

B-1.2.1 A typical thermocouple assembly conforming to **B-1.2** may be fabricated by fusion welding twisted ends of chromel - alumel wire not smaller than 0.52 mm² and not larger than 0.82 mm² in cross-section and mounting the leads in porcelain insulators so that the thermocouple head is 12 mm from the sealed end of a standard weight, normal 12 mm diameter iron, steel or inconel pipe.

B-1.3 Furnace

B-1.3.1 The furnace fuel and air supplies shall be adjusted such that the fire is uniformly distributed over the exposed faces of the cabinet and regulated to temperatures in accordance with the standard time temperature curve.

B-1.3.2 The furnace temperature, corresponding to time elapsed as given in Table 5 shall follow the equation:

$$T - T_0 = 345 \text{ Log}_{10} (8t + 1)$$

where

T = furnace temperature, in °C at any time, t , in minutes; and

T_0 = ambient temperature, in °C.

B-1.3.3 The accuracy of the furnace control shall be such that the area under time temperature curve, obtained by averaging all the furnace thermocouple readings, shall be within 10 percent of the corresponding area under the standard time temperature curve for 2 h.

B-2 PREPARATIONS FOR TEST

B-2.1 For Fire Endurance Tests

B-2.1.1 The sample to be subjected to fire endurance test shall have a 16 mm diameter through hole at the bottom. A pipe of the same external diameter shall be

welded to outer and inner body sheets of the cabinet. This hole shall be used for insertion of thermocouple wires inside the cabinet. After insertion of the thermocouple wires through the hole it shall be sealed by proper insulating compound from both ends of the hole.

Table 5 Relationship Between Time Elapsed and Furnace Temperature
(Clause B-1.3.2)

SI No.	Time min	Furnace Temperature °C
(1)	(2)	(3)
i)	5	538
ii)	10	704
iii)	15	760
iv)	20	793
v)	25	821
vi)	30	843
vii)	40	878
viii)	50	905
ix)	60	927
x)	70	946
xi)	80	963
xii)	90	978
xiii)	100	991
xiv)	110	1 001
xv)	120	1 010
xvi)	140	1 024
xvii)	160	1 038
xviii)	180	1 052
xix)	200	1 066
xx)	220	1 079
xxi)	240	1 093

B-2.1.2 For standard fire resisting filing cabinets two thermocouples shall be located at the centre of each insulated compartment, from each interior face. One of these shall be located 190 mm from back and the other 190 mm from the inner face of the drawer. For lateral fire resisting filing cabinet the thermocouple location shall be 190 mm from left side and the other 190 mm from the right side from the inner face of the drawer.

B-2.2 For Fire and Impact Tests

This test shall be conducted without any thermocouple inside the sample.

B-2.3 Furnace Temperature

The furnace temperature shall be recorded by thermocouples symmetrically distributed. At least four thermocouples shall be used, placed 50 mm from the exposed faces of the test sample including the door face.

B-2.4 Conditioning

The inside temperature of the samples at the start of the test shall be in accordance with IS 196. If the conditions inside the samples are not within the range then the sample shall be conditioned for at least 12 h prior to the tests the inside conditions.

B-2.5 Lifting Arrangement

Hooks for lifting for fire endurance and fire impact test shall be provided on the sample.

B-3 TESTS

B-3.1 Fire Endurance Test

B-3.1.1 The sample of fire resisting insulating filing cabinet prepared in manner specified in **B-2.1.1** and **B-2.1.2** is placed in the furnace. The storage area shall then be evenly filled with contents (*see B-1.1*) occupying volume equal to 25 to 30 percent of the volume of cabinet. The cabinet is then locked.

B-3.1.2 The furnace shall then be put on and the temperatures shall be read at intervals not exceeding 5 min during the test. Average of all the thermocouples outside the sample shall be recorded and shall be taken as the required value.

B-3.1.3 The pressure in the furnace chamber during the test shall be maintained as close as possible to atmospheric pressure.

B-3.1.4 The furnace fire shall be continued for 60 or 120 or 180 or 240 min for filing cabinet of 60 or 120 or 180 or 240 min rating respectively. During the fire endurance test, it is essential that at no time the internal temperature

of the cabinet, as shown by any of the thermocouples placed inside the cabinet, shall exceed 177°C irrespective of ambient temperature.

B-3.1.5 After the specified period, the furnace is switched off. The cabinet is continued to be kept in the furnace for cooling without opening the furnace. Temperature of interior of the sample cabinet shall be continuously recorded until the temperature inside the cabinet decreases by 3°C. Thereafter the door/drawer shall be opened. The contents shall be examined to determine their usability.

B-3.2 Fire and Impact Test

B-3.2.1 The sample to be subjected to this test shall have contents as specified in **B-3.1.1** and shall be subjected to test without any thermocouple inside the cabinet.

B-3.2.2 The cabinet shall be subjected to a standard fire exposure in a manner similar to the fire endurance test for a period of 30 min for cabinets of 60 min rating and 45 min for cabinets of 120 min rating. For cabinets of 180 min or 240 min rating, exposure time is 60 min.

B-3.2.3 After the fire exposure time, the furnace shall be switched off. The cabinet shall then be hoisted so that its bottom is 4 m above a layer of brick rubble (30 cm depth) on a heavy concrete base, and then dropped. Twenty minutes shall be elapsed from the time the furnace fire is extinguished until the cabinet is dropped.

B-3.2.4 After the impact, the cabinet shall be examined, for deformation / damage.

B-3.2.5 Immediately after the impact, the cabinet shall be inverted, put back in the test furnace, and again subjected to a standard fire exposure for a period of 30 min, 45 min, 60 min for a cabinet of 60 min, 120 min and 180/240 min rating respectively then the furnace shall be switched off and shall be allowed to cool to less than 47°C without opening the furnace. After the cabinet has cooled to a temperature less than 47°C, the sample shall be removed from the furnace and the door/drawer shall be opened to examine its heat insulating properties, as evidenced by the usability of the contents.

ANNEX C

(Foreword)

COMMITTEE COMPOSITION

Security Equipment Sectional Committee, MED 24

<i>Organization</i>	<i>Representative(s)</i>
Reserve Bank of India, Chennai	SHRI S. VENKATACHALAM (<i>Chairman</i>)
Bank of India, Mumbai	SHRI V. K. AGRAWAL SHRI L. K. SINGH (<i>Alternate</i>)
Bharat Diamond Bourses, Mumbai	SHRI MEHUL N. SHAH
Centre for Environment and Explosive Safety (DRDO), New Delhi	SHRI A. K. KAPOOR SHRI V. K. CHAUDHARY (<i>Alternate</i>)
Central Building Research Institute, Roorkee	DR T. P. SHARMA SHRI SUVIR SINGH (<i>Alternate</i>)
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Guardwell Industries Pvt Ltd, Mumbai	SHRI ANTHONY L. TUSCANO SHRI WILLIAM A. TUSCANO (<i>Alternate</i>)
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Indian Banks Association, Mumbai	SHRI V. RAMCHANDRAN
Loss Prevention Association of India Ltd, New Delhi	SHRI D. K. SARKAR SHRI T. P. RAO (<i>Alternate</i>)
Methodex Systems Ltd, New Delhi	SHRI A. K. VERMA SHRI KALPAK GANDHI (<i>Alternate</i>)
Punjab National Bank, New Delhi	CAPT S. P. SINGH CAPT DEEPAK SAGAR (<i>Alternate</i>)
Standard Chartered Bank, Mumbai	LT- CDR KISHAN GOPAL
Tariff Advisory Committee, Mumbai	SHRI S. K. CHOWDHARY
Tata Consultancy Services, Mumbai	SHRI SANJAY BAHL SHRI R. K. RAGHAVAN (<i>Alternate</i>)
The Gem and Jewellery Export Promotion Council, Kolkata	SHRI MAHESH RAO
Union Bank of India, Mumbai	SHRI R. RAJARAM SHRI TAPAN KUMAR BASU (<i>Alternate</i>)
BIS Directorate General	Shri C. K. Veda, Scientist 'F' & Head (MED) [Representing Director General (<i>Ex-officio</i>)]

Member Secretary
SHRI J. A. SIDDIQUI
Scientist 'E' (MED), BIS

Bureau of Indian Standards

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Review of Indian Standards

Amendments are issued to standards as the need arises on the basis of comments. Standards are also reviewed periodically; a standard along with amendments is reaffirmed when such review indicates that no changes are needed; if the review indicates that changes are needed, it is taken up for revision. Users of Indian Standards should ascertain that they are in possession of the latest amendments or edition by referring to the latest issue of 'BIS Catalogue' and 'Standards: Monthly Additions'.

This Indian Standard has been developed from Doc: No. MED 24 (0786).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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